
Virginia Department of Mines, Minerals & Energy
Division of Mines

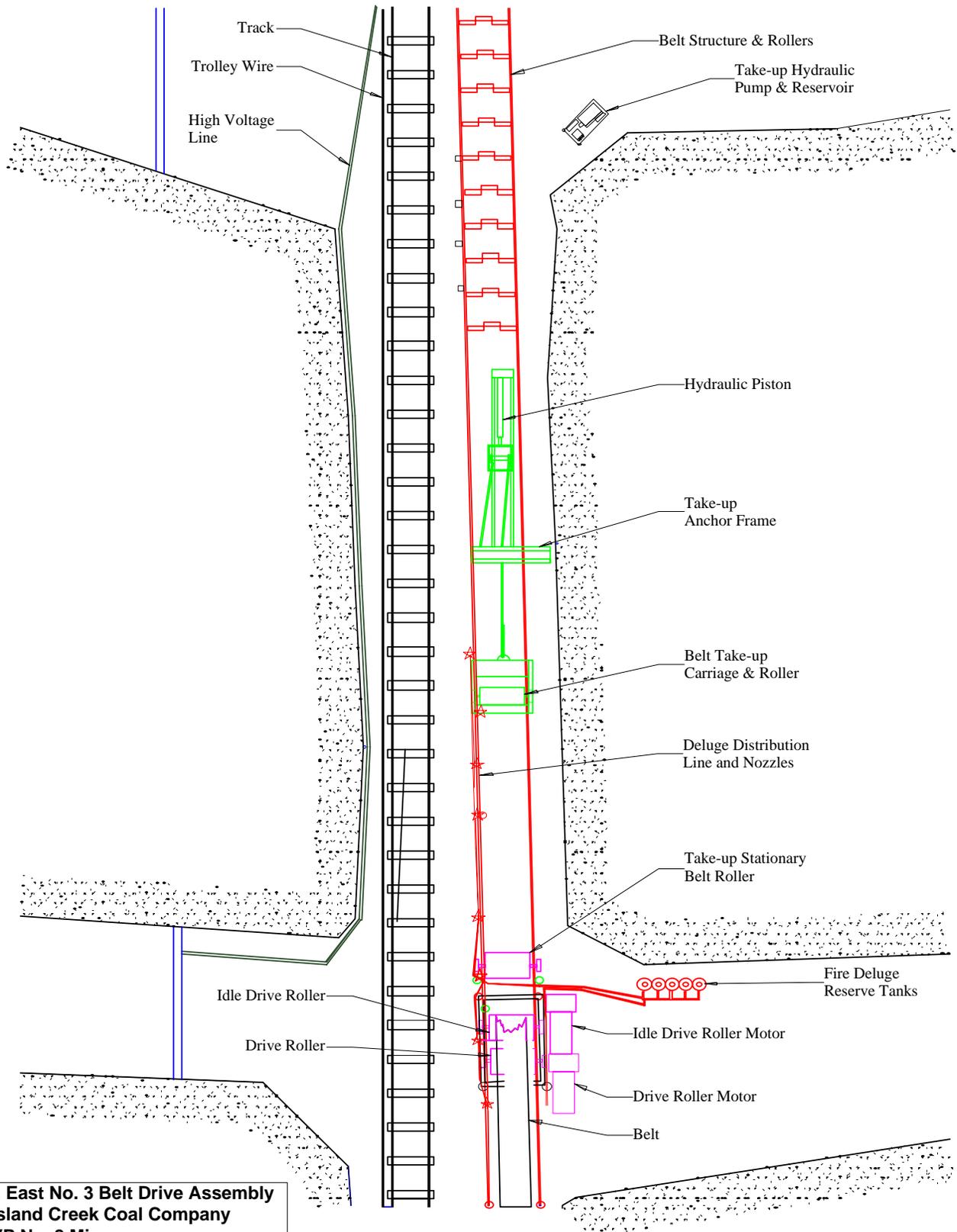
Accident Investigation/Mine Fire Report
Underground Coal Mine

Mine Fire Investigation
April 10, 2003

Island Creek Coal Company
VP No. 8 Mine
Mine Index No. 08776AC
Buchanan County, Virginia

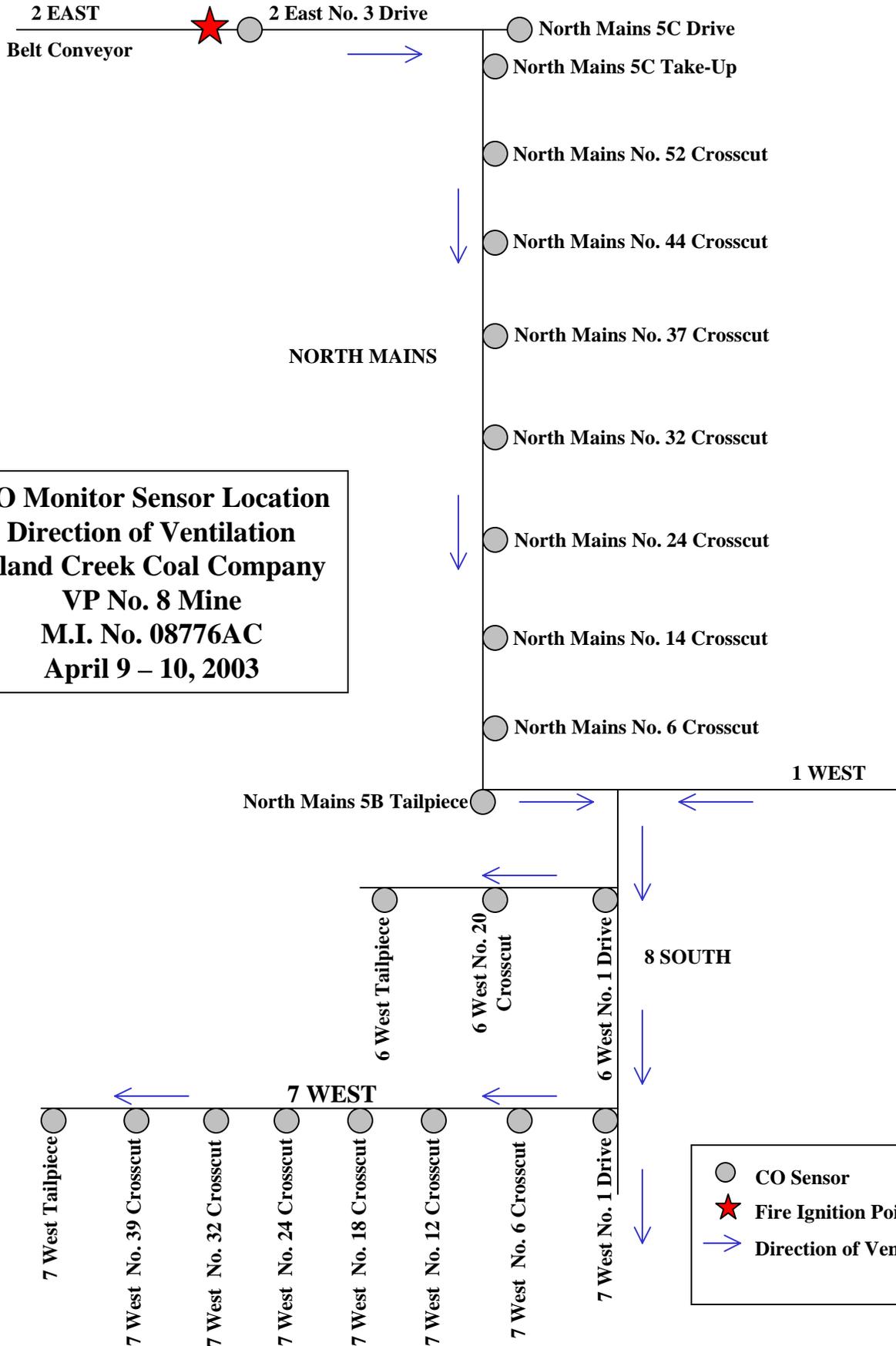
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2 East No. 3 Belt Drive Assembly
Island Creek Coal Company
VP No. 8 Mine
M.I. No. 08776AC
April 9-10, 2003

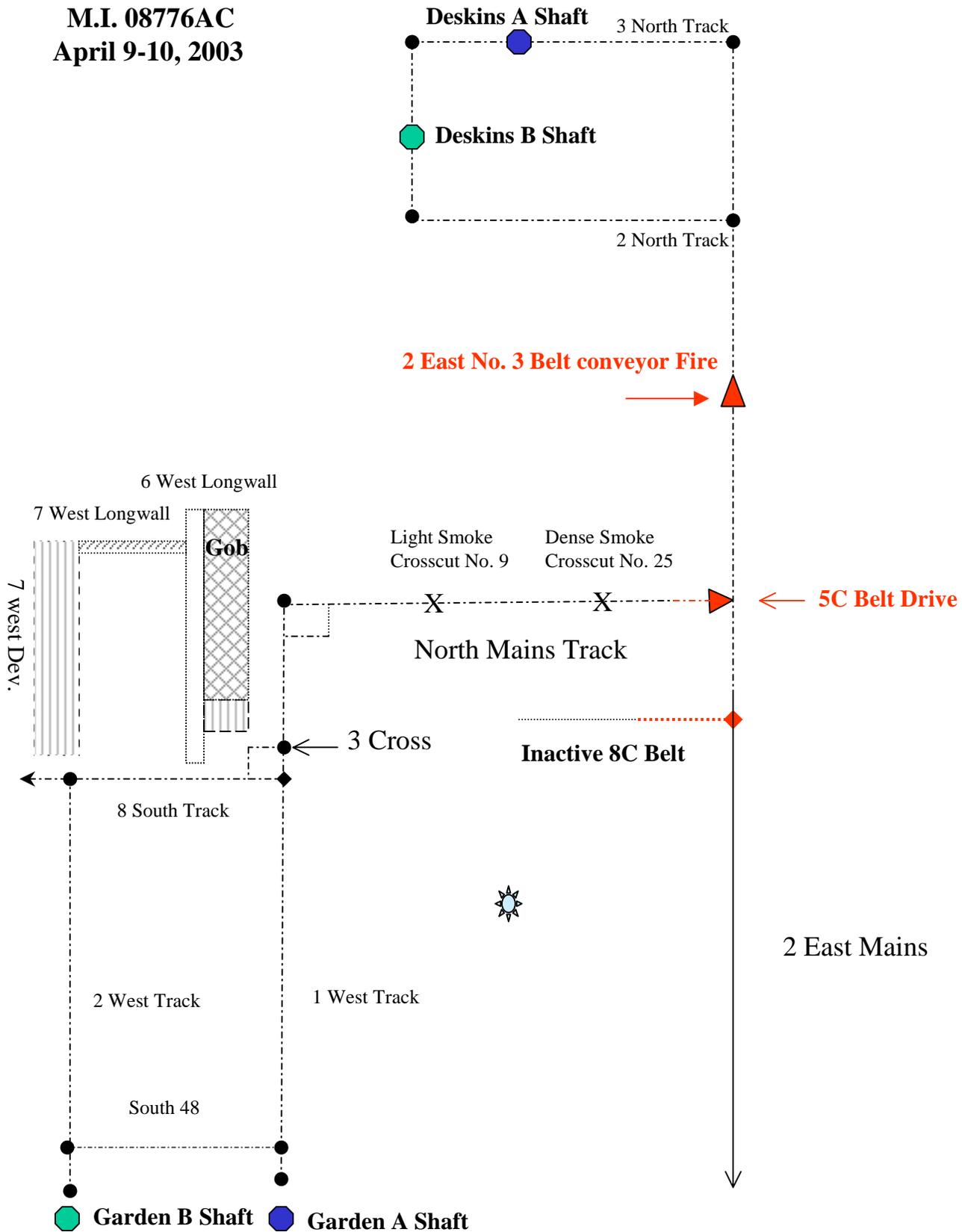
FIRE IGNITION POINT
2 East No. 3 Belt Drive



CO Monitor Sensor Location
Direction of Ventilation
Island Creek Coal Company
VP No. 8 Mine
M.I. No. 08776AC
April 9 – 10, 2003

- CO Sensor
- ★ Fire Ignition Point
- Direction of Ventilation

Travel Route
Island Creek Coal Company
VP No. 8 Mine
M.I. 08776AC
April 9-10, 2003



ACCIDENT INVESTIGATION / MINE FIRE REPORT
ISLAND CREEK COAL COMPANY
VP NO. 8 MINE
MINE INDEX 08776AC

On April 10, 2003, at approximately 12:20 a.m., a mine fire was discovered underground at the Island Creek Coal Company, VP No. 8 Mine, Mine Index 08776AC. The fire, which could not be extinguished within 30 minutes, was discovered in the belt and track entry of 2 East Mains at the 2 East No. 3 belt conveyor system. The fire apparently originated at the No. 3 belt conveyor drive assembly in the No. 4 entry of 2 East Mains, located on the Deskins side of the mine. The extent of the fire area was unknown upon initial discovery. Mine personnel located on the surface were alerted of a possible fire in the mine at approximately 12:09 a.m., on April 10, 2003, by receiving a high warning alarm signal from the carbon monoxide (CO) sensor located near the 2 East No. 3 belt conveyor drive hydraulic take-up unit. All underground mine personnel were evacuated from the mine by approximately 1:16 a.m. Although extensive damage occurred in the affected area of the mine, no injuries were reported as a result of the accident.

Representatives from the Department of Mines, Minerals and Energy's Division of Mines, and the Federal Mine Safety and Health Administration initiated an accident investigation upon notification of the mine fire. The Division of Mines and Mine Safety and Health Administration officials and various mine rescue teams provided support services during fire fighting operations. The fire was brought under control at approximately 10:30 a.m. and extinguished at approximately 12:25 p.m. on April 10, 2003. This mine is scheduled to receive two regular inspections every six months. A regular inspection was ongoing at the time of the mine fire.

COMMENTARY:

The Island Creek Coal Company, VP No. 8 Mine is a large shaft mine operation with portal shafts, production shafts, and surface preparation plants, located on State Route 624, Garden Creek, and on State Route 620, Deskins, in Buchanan County, Virginia. The mine utilizes continuous mining and longwall mining methods, producing approximately 9,798 tons of raw coal daily from the Pocahontas No. 3 coal seam. The average mining height is approximately 72 inches. Longwall panels are mined using four entry systems developed with continuous mining machines and shuttle cars. The mine has underground belt conveyor haulage systems designed to transport coal to both the Garden and Deskins surface facilities simultaneously. The VP No. 8 complex was formed in 1994 by connecting the underground mine workings of the former Island Creek Coal Company VP No. 5 Mine and the VP No. 6 Mine. The mine employs 219 personnel and operates three production shifts per day, seven days per week.

The underground coal production sections are located on the Garden side of the mine requiring the Garden B Shaft portal to be utilized as the primary portal, and is used by the majority of employees entering the mine. At the time of the accident, underground work activities included coal production on the 6 West development longwall section and set up work on the 7 West development longwall section

(new panel). Normally, only a limited number of employees enter the mine using the Deskins B Shaft portal. Work activities on the Deskins side are limited by the small number of employees entering this side of the mine. Work activities performed by mine personnel that enter the mine from the Deskins portal include: delivery of supplies from the Deskins surface supply area to the Garden side; belt conveyor haulage operations; coal storage activities at the Deskins bunker facility; belt conveyor maintenance; mine maintenance operations; Deskins production shaft operations and mine examinations. Both trolley and Brookville diesel powered track equipment are used to provide transportation for underground mine personnel. The underground rail traffic is controlled by a surface dispatcher. Only a limited number of transportation vehicles is maintained on the Deskins side of the mine.

On Wednesday, April 9, 2003, the second shift entered the mine at approximately 4:00 p.m. The 6 West longwall section production personnel were near completion of mining on this panel. The 6 West longwall production personnel mined 20 feet from the longwall face leaving the head of the longwall at 0 feet and the tail at -1 foot at the end of the second shift. The main priority of second shift personnel was to complete mining on the 6 West longwall panel so that preparations for moving the longwall equipment could begin on the oncoming third shift.

Longwall set-up operations were also being completed on the 7 West longwall new face in preparation for the upcoming longwall move, as a number of shields on the 6 West longwall would be required to be moved to the 7 West longwall face area. At the completion of the second shift, the 6 West longwall production personnel and the 7 West longwall set-up personnel remained on their respective sections while awaiting shift change with the oncoming third shift, commonly referred to as "hot seating". The "hot seating" work schedule resulted in personnel transportation equipment not being present on the working sections until the oncoming third shift arrived to switch out with second shift personnel on their respective working sections.

Near the end of the second shift, Mr. Gerald Mathena, beltman, completed general maintenance work on the Deskins 2 East belt conveyor system and traveled to the Deskins coal storage bunker to relieve Mr. Larry Street, beltman, who had to leave early from work. At approximately 11:20 p.m., while waiting for Mr. Mathena to arrive, Mr. Street applied rock dust to the area located between the bunker and the 2 East No. 3 belt conveyor drive, located one crosscut inby the bunker area. Upon Mr. Mathena's arrival, Mr. Street had a brief conversation with Mr. Mathena concerning the bunker work area before he departed to the Deskins shaft bottom. Mr. Mathena continued monitoring the 2 East No. 3 belt operations while the bunker was emptied in preparation for an expected idle production period that would occur during the 6 West longwall move. At approximately 11:45 p.m., Mr. Harold Farmer, second shift Deskins A Shaft skip operator, called Mr. Mathena and informed him that the Garden side had stopped transferring coal to the Deskins side. The coal had been diverted from the Deskins side belts to the Garden side belts at approximately 11:15 p.m. While the 2 East No. 3 belt was operating, near the end of the shift, the belt stopped operating unexpectedly. Mr. Mathena restarted the belt with the remote control switch located in the bunker control station. Shortly after restarting, the belt stopped operating again. At this time, Mr. Mathena checked the spill switch located on the mine floor underneath the 2 East No. 3 belt, inby the bunker control station. Mr. Mathena observed a small accumulation of coal located on top of the spill switch and removed the coal. While realizing that the belts had time to empty, Mr. Mathena did not attempt to restart the 2 East No. 3 belt. At approximately 12:00 a.m., Mr. Mathena turned the 2 East No. 3 belt control and bunker control switches to the off

position in the bunker control station and prepared to depart to the Deskins shaft bottom. Mr. Mathena applied rock dust to the mine floor in the high top area located in the vicinity of the spill switch and then departed this location enroute to the Deskins shaft bottom.

While traveling enroute to the Deskins shaft bottom, Mr. Mathena picked up Mr. Donnie Farmer, third shift Deskins A Shaft skip operator, who was located at the Deskins A Shaft. Earlier, Mr. Donnie Farmer had relieved Mr. Harold Farmer, second shift skip operator, at the Deskins A Shaft. Mr. Donnie Farmer traveled with Mr. Mathena to the Deskins shaft bottom in order to obtain the Brookville locomotive that Mr. Mathena was operating.

After arriving at the Deskins shaft bottom, Mr. Mathena traveled to the surface using the Deskins B Shaft elevator hoist. After arriving on the surface, Mr. Mathena began preparations to send diesel fuel underground to Mr. Donnie Farmer. Mr. Mathena sent two cans of diesel fuel to the Deskins B Shaft bottom for Mr. Donnie Farmer. Mr. Mathena remained at the Deskins B Shaft surface area while awaiting for Mr. Farmer to return the empty fuel cans to the surface.

While unknown to Mr. Mathena at the time he was working at the Deskins bunker and 2 East No. 3 belt drive area, Mr. Dale Honaker, Garden warehouse supervisor, received a low warning CO alarm signal at approximately 11:52 p.m. from the 2 East No. 3 belt drive CO monitor sensor, as verified at the master control station located in the warehouse. Mr. Honaker contacted Mr. Michael Cooper, Garden second shift dispatcher, and reported the low CO alarm. Mr. Cooper attempted to contact Mr. Mathena at the Deskins bunker to inform him of the low alarm but was unsuccessful. During this time, Mr. Cooper called Mr. Honaker and Mr. Honaker reported that the low CO alarm had cleared in approximately three minutes, according to the master control station.

Mr. Cooper contacted Mr. Dana Gilbert, construction foreman, located at the Deskins mine office, and notified him of the low warning CO alarm at the 2 East No. 3 belt drive and instructed him to dispatch someone to check this area. At this time, Mr. Jimmy Stiltner, third shift construction foreman, was leaving the mine office and preparing to enter the mine on the Deskins side. Mr. Gilbert informed Mr. Stiltner about the low warning CO alarm and instructed him to check the 2 East No. 3 belt drive area. Mr. Stiltner entered the Deskins side of the mine at approximately 12:02 a.m., April 10, 2003.

Near the completion of the second shift, at approximately 11:57 p.m., Mr. Cooper was preparing to be relieved of his duties at the Garden dispatcher's office by Mr. Harold Creed, third shift dispatcher. As usual, Mr. Cooper and Mr. Creed briefly discussed the status and location of underground track vehicles. At approximately 12:05 a.m., as Mr. Cooper was preparing to depart, Mr. Honaker notified Mr. Creed of a second low warning CO alarm at the 2 East No. 3 belt drive area. Mr. Cooper informed Mr. Creed that he had received a low warning CO alarm earlier at this location and was informed by Mr. Gilbert that he had dispatched Mr. Stiltner to go check the affected area. At this time, Mr. Creed became busy with a number of mine telephone calls and Mr. Cooper departed the dispatcher's office.

Mr. Creed received a call from Mr. Bob Sutherland, third shift construction foreman, who was located on the Garden B Shaft bottom, requesting travel clearance to the top of North Mains. Mr. Sutherland and Mr. Chris Whitt, mine examiner, had entered the mine prior to the beginning of the third shift and were planning to travel to the top end of North Mains to conduct scheduled weekly mine examinations of this area, while using a diesel-powered personnel mantrip. Mr. Creed instructed Mr. Sutherland to

wait for traffic to clear at the South 48 track switch, located near the Garden B Shaft bottom, and then call again upon his arrival at 3 Cross, located at the 8 South and 1 West junction. Following Mr. Creed's conversation with Mr. Sutherland, Mr. Honaker called Mr. Creed again informing him that the low warning CO alarm, received at approximately 12:05 a.m., had cleared in approximately one minute.

While Mr. Sutherland was traveling the 2 West trackway enroute to 3 Cross, the Garden third shift personnel attended a brief safety meeting that was conducted on the surface and then entered the mine at approximately 12:10 a.m., on April 10, 2003. Mr. Creed granted travel clearance to third shift personnel on the 2 West trackway from the Garden B Shaft bottom to the entrance of 6 West. The third shift personnel were traveling in eight units of diesel powered track equipment.

A short period of time elapsed and Mr. Honaker called Mr. Creed again at 12:09 a.m., notifying him of a high warning CO alarm that he had received at the 2 East No. 3 belt drive area. Mr. Creed informed Mr. Honaker that Mr. Sutherland was traveling toward 3 Cross and that he would instruct Mr. Sutherland to contact him when he arrived at 3 Cross. Mr. Creed immediately contacted Mr. Eddie Breeding, third shift maintenance foreman, located on the Garden surface, and instructed him to contact Mr. Honaker. Mr. Creed also called the Deskins shaft bottom while attempting to contact Mr. Stiltner. Mr. Creed contacted Mr. Stiltner and informed him that Mr. Mathena was traveling toward the Deskins shaft bottom by the Deskins A Shaft route and instructed him to travel immediately to the 2 East No. 3 belt drive area to investigate the high warning CO alarm.

Mr. Stiltner arrived at the 2 East No. 3 belt drive at approximately 12:20 a.m. and observed a large fire near the belt drive area. Mr. Stiltner could not accurately determine the full extent of the fire area due to the presence of dense smoke, but he initially thought that the fire had only spread approximately one crosscut inby the belt drive area.

At approximately 12:23 a.m., Mr. Honaker contacted Mr. Creed and informed him that he had received a high warning CO alarm at the 5C belt drive, that alarms were occurring in sequence, and the 2 East No. 3 belt drive fire deluge system had activated. Mr. Honaker stated that he was concerned about the way that the alarms were activating in sequence.

Upon his arrival at 3 Cross, Mr. Sutherland called Mr. Creed and Mr. Creed informed him of the high CO alarm at the 2 East No. 3 belt drive and instructed him to contact Mr. Honaker. Mr. Sutherland contacted Mr. Honaker and Mr. Honaker informed him of the high CO alarm at the 2 East No. 3 belt drive sensor, that the 2 East No. 3 belt drive fire deluge system had activated, that alarms were being activated in sequence and that it did not look good. Mr. Sutherland called Mr. Creed again to request travel clearance and Mr. Creed instructed him to proceed to the top of the North Mains. While traveling toward the top of North Mains at 5 West, Mr. Sutherland smelled something similar to a hot bearing. Mr. Sutherland also observed that the belts were not operating in this area.

Upon his arrival at 4 West, Mr. Sutherland stopped and contacted Mr. Creed informing him that he had smelled smoke and that he was proceeding on toward the top end of North Mains. Mr. Sutherland continued traveling the North Mains trackway and first saw light smoke at crosscut number nine. Mr. Sutherland continued his travel and first encountered dense smoke at crosscut No. 25. The concentration of smoke was so dense that the trackway became invisible to Mr. Sutherland. Mr. Sutherland made a gas test with his handheld MX-270 gas detection instrument and detected 12 ppm CO

and immediately began retreating back toward the Garden side of the mine. Mr. Sutherland stopped at 4 East and called Mr. Creed to report the dense smoke. Mr. Creed directed Mr. Sutherland to travel back to the entrance of 6 West. Mr. Sutherland proceeded to travel back toward the entrance of 6 West, located on the 8 South trackway while enroute to the Garden side shaft bottom. Mr. Creed contacted Mr. Michael Monk, Garden side third shift mine foreman, and informed him of the high CO alarm and smoke. Mr. Creed informed Mr. Monk that he was planning to hold third shift personnel at the entrance of 6 West, while anticipating that evacuation of mine personnel may be necessary. Mr. Monk concurred and authorized Mr. Creed's intentions to initiate evacuation of mine personnel. At the time the evacuation was initiated, there were approximately 60 mine personnel underground, including 15 second shift personnel.

Upon receiving notification of the third shift personnel arriving at the entrance of 6 West, Mr. Creed instructed all personnel to dismount the diesel powered mantrips except for one person on each mantrip to travel immediately to the 6 West longwall production section and 7 West longwall set-up section, pick up second shift personnel and to begin immediate evacuation. Mr. Creed attempted to contact Mr. Stiltner but was unsuccessful.

Mr. Kim Noah, Garden side second shift mine foreman, contacted Mr. Gilbert, located at the Deskins mine office and informed him of Mr. Sutherland's report of observing dense smoke at 4 West. Immediately upon receiving notification of the dense smoke, Mr. Gilbert began making preparations to proceed underground and traveled to the Deskins B Shaft portal to enter the mine. Mr. Gilbert met Mr. Mathena at the portal and informed him of the situation. Mr. Mathena informed Mr. Gilbert that he would accompany him. Mr. Gilbert and Mr. Mathena awaited arrival of the empty diesel fuel cans sent to the surface by Mr. Donnie Farmer. While waiting on the elevator cage at the top of the Deskins B Shaft portal, Mr. Gilbert received a call from Mr. Stiltner. Mr. Stiltner informed Mr. Gilbert of the fire discovered at the 2 East No. 3 belt drive area and that he had not been able to contact the Garden side. Mr. Gilbert notified the Deskins surface security guard and instructed him to call by public telephone and inform Garden side personnel about the fire. Mr. Gilbert and Mr. Mathena removed the empty diesel fuel cans from the elevator cage and then entered the mine. Upon his arrival at the Deskins shaft bottom, Mr. Gilbert observed that the underground power was de-energized.

Mr. Gilbert and Mr. Mathena stopped at various locations and gathered fire fighting materials as they traveled toward the 2 East No. 3 belt drive area. Mr. Gilbert and Mr. Mathena arrived at the 2 East No. 3 belt drive, at approximately 12:30 a.m., and began assisting Mr. Stiltner with fire fighting efforts. Later, Mr. Mathena departed the fire area and initiated communications with mine personnel located on the surface at the Deskins side of the mine and requested transportation vehicles and fire fighting equipment including tools, fire hoses, and waterline manifolds equipped with multiple fire hose connectors.

During this time, third shift personnel arrived with transportation vehicles on the 6 West and 7 West longwall sections and picked up second shift personnel and proceeded with evacuation on the Garden side of the mine. At approximately 1:16 a.m., on April 10, 2003, the evacuation of all mine personnel on the Garden side was completed. All mine personnel were accounted for using the personnel check system record maintained on the Garden side.

During this time, Mr. Monk notified Mr. Bill Meade, mine superintendent, informing him of the mine emergency and evacuation of mine personnel. Mr. Meade instructed Mr. Monk to assemble readily available firefighting equipment and supplies and transport them overland to the Deskins side of the mine. Mr. Meade called back to the Garden side and talked to Mr. Noah and instructed him to assemble all foremen and any other available fire-fighting equipment and travel overland to the Deskins side. Mr. Meade notified other company officials and then proceeded to the mine site. Mr. Noah reported the mine emergency to Division of Mines and Mine Safety and Health Administration officials. Other mine management personnel from the Garden side traveled overland to the Deskins side to assist with fire fighting efforts. Upon arrival at the Deskins side, mine management personnel established a surface command center at the Deskins mine office to coordinate firefighting efforts and to provide necessary support services as required by the mine emergency. The foremen from the Garden side of the mine entered the Deskins portal and began supporting and assisting fire fighting efforts at the 2 East No. 3 belt drive area. Due to a limited number of underground transportation vehicles available on the Deskins side of the mine, additional transportation equipment was transported overland from the Garden side to the Deskins side of the mine.

Mine rescue teams affiliated with the Island Creek Coal Company - VP No. 8 Mine, Consolidation Coal Company - Buchanan No. 1 Mine, and Jewell Smokeless Coal Corporation were summonsed to the Deskins mine office. Other mine rescue teams affiliated with Consolidation Coal Company were summonsed from Kentucky, West Virginia, and Pennsylvania to assist in providing mine rescue services.

The Island Creek Coal Company mine rescue team entered the fire area, using self contained oxygen breathing apparatus, and initiated exploration activities inby the location of the 2 East No. 3 belt drive area toward the 5C belt drive area, while attempting to determine the extent of the fire area. The high volume of air coursed through the 2 East No. 3 belt and track entry, and the presence of combustible material significantly increased the severity and rate of expansion of the fire. The location and direction of the fire also increased other potential risks due to extensive bleeder systems and sealed gob areas bordering the fire area. The Island Creek mine rescue team verified the extent of the fire and initiated fire fighting efforts to contain the fire. It was determined that the fire had advanced to the 5C belt drive area located approximately 1,225 feet inby the 2 East No. 3 belt drive assembly. The fire had advanced beyond the inactive 8C belt conveyor entry, for a distance of approximately 280 feet, and had extended approximately 275 feet along the 8C belt entry before the fire could be contained and extinguished. The active fire was evaluated to be under control at approximately 10:30 a.m. and the fire was extinguished at 12:25 p.m., April 10, 2003, except for hot spots that required repeated applications of water.

PHYSICAL FACTORS

The investigation of physical factors at the scene of the accident revealed the following:

1. The fire apparently originated at the 2 East No. 3 belt conveyor drive assembly, located in the No. 4 entry of the 2 East Mains, approximately 140 feet inby survey station No. 6181. The belt drive is anchored to the mine floor and the discharge roller is suspended in a belt channel cut in the mine roof. The belt drive discharge roller is installed at the coal transfer point, located one crosscut outby the drive unit.
2. The fire ignition source could not be determined as the fire caused extensive damage to all equipment and possible ignition sources located in the No. 4 entry. Methane tests were conducted near the mine floor at the location of the No. 3 belt conveyor hydraulic take-up unit and no methane was detected.
3. The 2 East Mains No. 4 entry is also utilized for belt and track haulage. The average height of the No. 4 entry was approximately six feet and the entry width was approximately twenty-two feet. The trackway was equipped with trolley wire and a high voltage cable was installed on the trolley wire side of the trackway.
4. The 2 East No. 3 belt conveyor system consisted of a 54 inch conveyor belt installed with a Continental belt drive unit and Continental rigid structure. No discernible markings were available on the belt to identify the belt manufacturer. The belt conveyor was suspended from the mine roof with steel chains.
5. The total fire area extended into the following areas:
 - a. Approximately 1,225 feet along the 2 East No. 3 belt conveyor including adjacent crosscuts located in No. 4 entry and approximately 280 feet in the No. 4 Entry, inby the location of the 2 East No. 3 belt conveyor tailpiece;
 - b. Into No. 4 entry at the top end of North Mains for a distance of approximately 85 feet, including the active 5C belt conveyor drive assembly and associated components;
 - c. Into No. 5 entry at the top end of the North Mains for a distance of approximately 275 feet, including the inactive 8C belt conveyor drive assembly and associated components.
6. The 2 East No. 3 belt conveyor (No. 4 entry) was ventilated with an intake air current totaling 120,417 cubic feet per minute, which contributed to the rate of expansion and area encompassed by the fire. A common neutral entry (No. 5 entry) was ventilated with an intake air current totaling 127,200 cubic feet per minute. The two ventilation air currents were also used to ventilate the East bleeder and the No. 3 South Mains seals.
7. An accurate determination of when the fire started could not be established, but the CO monitoring system computer master station print out record verified the following events with corresponding times at specific locations:

April 9, 2003	11:52 p.m.	A low CO alarm (7.2 ppm) at 2 East No. 3 belt drive assembly
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- April 10, 2003
- 12:05 a.m. A low CO alarm (10 ppm) at 2 East No. 3 belt drive assembly
 - 12:09 a.m. A high CO alarm (12.4 ppm) at 2 East No. 3 belt drive assembly
 - 12:22 a.m. A high CO alarm (13.3 ppm) at 5C belt drive assembly, located downwind from the 2 East No. 3 belt drive assembly.
 - 12:23 a.m. The fire deluge (dry chemical) system was activated at 2 East No. 3 belt drive assembly.

The CO sensor provided for the 2 East No. 3 belt conveyor drive assembly that activated the system's alarms was located near the 2 East No. 3 belt conveyor hydraulic take-up unit. The CO monitoring system master control station is located on the Garden side of the mine in the warehouse and is continuously monitored by the warehouse supervisor.

8. Mine officials reported that a time discrepancy existed between the time displayed on the computer master control station and the clock time displayed at the dispatcher's work area. The Eastern daylight savings time displayed on the computer master control station visual terminal was four minutes faster than the time displayed on the clock located in the dispatcher's work area.
9. The fire suppression system provided for the 2 East No. 3 belt conveyor drive was an ECKO Model 310-C dry chemical deluge type system. This system activated on April 10, 2003, at 12:23 a.m., approximately 31 minutes after the first CO alarm was activated at this location.
10. The 2 East No. 3 belt drive remote control and bunker control switches, located in the bunker control station, were observed in the off position during the investigation.
11. A six inch steel waterline equipped with fire fighting outlets at various locations was located in the 2 East Mains No. 5 entry (adjacent and common to the No. 4 entry where the fire occurred). This line provided the water source that was used during fire fighting efforts.
12. The fire consumed the entire belt conveyor located in the No. 4 entry from approximately 140 feet in by survey station No. 6181 and extending in by approximately 1,225 feet. The fire destroyed the hydraulic take-up unit provided for the 2 East No. 3 belt conveyor. The fire destroyed all the wooden posts installed as supplemental roof supports along the belt line. The fire destroyed and/or damaged various other items located in the belt entry including: belt structure frame work; top and bottom conveyor belt rollers; high voltage cable and feed-through unit; trolley wire; belt control cable; CO sensor cable; telephone cable; wood cribs; wood components of fiber cribs; the active 5C belt drive assembly; and the inactive 8C belt drive assembly.
13. The mine roof conditions deteriorated in the fire area and a number of permanent roof supports in isolated areas were affected by direct contact with the flames and extreme heat. Roof evaluations revealed that permanent roof supports did not appear to be

damaged by the fire and heat, except in isolated areas. Loose draw rock in the mine roof had to be scaled down at various locations within the fire area.

14. The permanent roof supports installed in the affected fire area consisted of 60 inch fully grouted, resin rods installed with six inch by six inch bearing plates and some oversized bearing plates. Supplemental roof supports consisting of 96 inch tension roof bolts and wood and fiber cribs had been installed in various intersections along the belt and track entry in the fire area.
15. The air currents used to ventilate the 2 East No. 3 belt haulage and the North Mains 5C belt haulage entries were used to ventilate the 6 West and 7 West longwall working sections, as verified by a ventilation evaluation and activation of the CO monitoring sensors provided at the referenced locations. The CO monitoring system computer master station print out record verified the following events with corresponding times at specific locations:

April 10, 2003	1:11 a.m.	A high CO alarm (17.7 ppm) at 6 West No. 1 belt drive
	1:12 a.m.	A low CO alarm (11.3 ppm) at 6 West high voltage transformer
	1:18 a.m.	A low CO alarm (14.8 ppm) at 6 West belt tailpiece
	1:22 a.m.	A low CO alarm (8.8 ppm) at 7 West No. 1 belt drive
	1:27 a.m.	A high CO alarm (12.2 ppm) at 7 West No. 1 belt drive
	1:35 a.m.	A high CO alarm (12.7 ppm) at crosscut No. 6 on 7 West
16. An examination of the 2 East No. 3 belt conveyor drive assembly revealed frictional wear in the steel metal frame, apparently caused by the belt rubbing both sides of the frame. The belt had worn holes through the one-half inch thick steel metal frame at two areas located on the off-track side of the belt take-up stationary roller bearing frame. It could not be determined during the investigation when the belt had caused the frictional wear to the metal belt drive frame. Mine personnel stated in interviews that on previous shifts prior to April 9, 2003, that the belt was out of alignment causing it to rub the sides of the metal belt drive frame. At the beginning of the second shift on April 9, 2003, a beltman visually inspected the affected area of the belt drive and verified that the belt was not rubbing the belt drive frame. An examination of an undamaged section of the 2 East No. 3 belt, located outby the belt drive, revealed physical evidence of substantial frictional wear on the belt on the off-track side of the belt. It could not be determined how or when this frictional wear had occurred.
17. The 2 East No. 3 belt conveyor take-up stationary roller with attached bearings was removed from the accident scene and transported to the surface for inspection. Mine personnel stated in interviews that the off-track side bearing associated with this roller may not have been operating properly and was described as getting hot approximately three days before the fire occurred, even though no problems were identified on the day of the fire. Both of the

stationary roller bearings were inspected on May 2, 2003, and both appeared to be operating properly and did not reveal any signs of excessive heat. The caps provided for both bearings were removed and visual observations revealed ample grease lubricant on all internal components. A visual examination of all internal components did not reveal any defects. An overall evaluation of both bearings is that they were operating properly when the fire started at an undetermined location in this general area.

18. The high voltage cable that supplied electrical power to this area of the mine was destroyed by the fire in the 2 East No. 3 belt and track entry. Electrical components and wiring that was destroyed and/or damaged by the fire were replaced. Electrical power was restored to this area and examinations and tests of the T-35 combination transformer and associated 2 East No. 3 belt drive electrical circuits were conducted on May 6, 2003. The slip, sequence and remote switches de-energized the belt drive motor circuit when tested and were evaluated to be operating properly. A ground fault test on the belt drive motor electrical circuit was conducted and was evaluated to be operating properly.
19. The high voltage system that provides electrical power to the Deskins side of the mine, including the 2 East No. 3 belt conveyor system, tripped (de-energized) at the surface high voltage substation and displayed a ground fault condition resulting from fire damage to the high voltage cable.
20. The belt examination record books associated with the 2 East No. 3 belt conveyor system did not reveal any hazardous conditions observed in conjunction with required examinations for the second and third shifts on April 9, 2003. The dayshift belt examination record books for April 9, 2003 did reveal a hazardous condition in that a broken bottom roller located at crosscut No. 89 was identified and corrected by removing the roller. The electrical examination record books associated with the 2 East No. 3 belt conveyor system indicated that the fire deluge system, belt slippage and belt sequence switches were examined and a visual inspection of the electrical components was conducted. The electrical examination record books did not indicate any equipment defects observed during the electrical examinations conducted on March 29, 2003 and April 3, 2003.
21. An exact location where the fire started could not be determined, but the scene investigation revealed that the fire most likely started at some location between the 2 East No. 3 belt conveyor hydraulic take-up unit and the take-up unit stationary roller. The origin of the fire could not be determined even though the following factors were recognized as possibly causing or contributing to potential ignition sources:
 - a) A defective belt conveyor structure roller may have caused frictional heat igniting the belt at the time the belt stopped operating. Due to the fire damage and fire fighting efforts, it could not be determined if a defective roller existed before the fire occurred.
 - b) The mine floor heaving that caused alignment distortion of the steel belt drive discharge roller frame assembly and the unlevelled take-up frame could have contributed to a belt misalignment situation causing the belt to rub the sides of the belt drive frame producing frictional heat.

- c) Mine personnel identified repeated problems between April 5, 2003 and before April 9, 2003 of heat and smoke being generated near the off-track side bearing and frame of the hydraulic take-up unit stationary roller. The source relating to the heat and smoke observed in this area could not be accurately determined but most likely resulted from the belt rubbing the sides of the belt take-up stationary roller bearing frame. Physical evidence revealed that the belt had been rubbing the sides of the frame and holes were worn through the steel metal frame at two areas, located on the off-track side of the belt take-up stationary roller bearing frame.
- d) Physical evidence on the edge of the belt conveyor outby the fire area on the off-track side revealed substantial frictional wear that could have produced significant heat.

It could not be determined exactly when the abovementioned conditions occurred except for the history of heat and smoke observed in this area between April 5, 2003 and before April 9, 2003. A general consensus of mine personnel was that no problems had occurred with the operation of the 2 East No. 3 belt conveyor system on the day shift and second shift on April 9, 2003, prior to the fire.

- 22. The mine utilizes two independent underground telephone systems consisting of a conventional battery powered paging telephone system and a touch-tone dial type system. The dial type telephone system has the capability of accessing the public telephone system. The dial type telephone has a small paging light mounted on the telephone unit that will flash for 30 seconds when a call is received. The telephone connection will automatically terminate if the call is not answered within 30 seconds.

STATEMENTS FROM MINE PERSONNEL AND OTHER FACTORS

Statements from mine personnel interviews and other factors determined during the investigation revealed the following:

1. Mine personnel stated that they were alerted of a possible fire at approximately 12:09 a.m., on April 10, 2003, by receiving a high level warning alarm from a CO sensor located near the 2 East No. 3 belt conveyor drive hydraulic take-up unit.
2. There were no eyewitnesses present when the accident (mine fire) occurred.
3. Mr. Honaker, warehouse supervisor, stated that a low warning CO alarm was received on the master control station at approximately 11:52 p.m., on April 9, 2003, for the 2 East No. 3 belt conveyor, belt drive area. He stated that this initial alarm cleared in approximately three minutes, according to the master control station computer readout screen. He stated that a second low warning CO alarm was received at approximately 12:05 a.m. and cleared in approximately one minute. He stated that a high warning CO alarm was received at approximately 12:09 a.m. He also stated that he became concerned, at approximately 12:22 a.m., when he received a high warning CO alarm at the 5C belt drive, that alarms were activating in sequence and that the 2 East No. 3 belt drive fire deluge system had activated. He stated that he reported each of the CO alarms and events to Mr. Creed.
4. Mr. Cooper, second shift dispatcher, stated that Mr. Honaker contacted him at approximately 11:52 a.m., on April 9, 2003, and reported a low warning CO alarm at the 2 East No. 3 belt conveyor drive sensor. He stated that he attempted to contact Mr. Mathena, who was assigned to this work area at this time, but was unsuccessful. He stated that he called Mr. Honaker back and Mr. Honaker reported that the low CO alarm had cleared in approximately three minutes. He stated that he contacted Mr. Gilbert, second shift construction foreman, informing him of the low CO alarm and instructed him to dispatch someone to check the 2 East No. 3 belt drive area. He stated that before he departed the dispatcher's office at the end of his shift that Mr. Honaker reported a second low CO alarm to Mr. Creed, third shift dispatcher. He stated that he informed Mr. Creed that he had received a low CO alarm earlier at this location.
5. Mr. Creed, third shift dispatcher, stated that Mr. Honaker contacted him at approximately 12:05 a.m. on April 10, 2003, and reported a low warning CO alarm at the 2 East No. 3 belt drive sensor. The master control CO computer record revealed that this was the second low CO alarm that was activated at this location. He stated that Mr. Honaker called him back and reported that the low CO alarm had cleared in approximately one minute. He stated that Mr. Honaker called him again at approximately 12:09 a.m. and reported a high warning CO alarm at the 2 East No. 3 belt drive sensor. He stated that he contacted Mr. Stiltner and instructed him to travel immediately to the 2 East No. 3 belt drive area to investigate the high CO alarm.
6. Mr. Mathena, beltman, stated that he relieved Mr. Larry Street of his duties at the Deskins bunker / 2 East No. 3 belt conveyor work area at approximately 11:25 p.m. He stated that he continued operating the bunker and the 2 East No. 3 belt conveyor while allowing both to empty

in preparation for an expected idle production period due to the 6 West longwall move. He stated that near the end of the shift the 2 East No. 3 belt stopped operating unexpectedly and that he restarted the belt with the remote control switch located in the bunker control station. He stated that the 2 East No. 3 belt stopped operating a second time and that after realizing the belts had emptied, he did not restart the belt. He stated that after confirming the coal had been diverted from the Deskins side to the Garden side belts, he turned the 2 East No. 3 belt control and bunker switches to the off position in the bunker control station before departing from this area. He stated that before he departed the bunker area to travel to the Deskins B Shaft bottom at approximately 12:00 a.m., he applied rock dust to the mine floor in the high top area located in the vicinity of the spill switch. He stated that upon arriving on the surface, he re-entered the mine with Mr. Gilbert to investigate the reported dense smoke.

7. Mr. Stiltner, third shift construction foreman, stated that he was initially instructed by Mr. Gilbert to investigate a low warning CO alarm at the 2 East No. 3 belt drive area. Mr. Stiltner stated that while he was located at the Deskins shaft bottom, he was contacted and instructed by Mr. Creed, third shift dispatcher, to travel immediately to the 2 East No. 3 belt drive area to investigate a high warning CO alarm. He stated that he had no knowledge of smoke or actual fire until he arrived at the 2 East No. 3 belt drive area, at which time he observed a large fire in this area. He stated that he contacted Mr. Gilbert and reported a large fire at this location and that he had not been able to contact Garden side personnel. He stated that he initiated fire-fighting activities.
8. Mr. Sutherland, third shift construction foreman, stated that he and Mr. Chris Whitt, mine examiner, entered the mine prior to the beginning of the third shift and planned to conduct weekly mine examinations in the North Mains area. He stated that when he arrived at 3 Cross, he contacted Mr. Creed and Mr. Creed informed him of a high warning CO alarm at the 2 East No. 3 belt drive and instructed him to contact Mr. Honaker. Mr. Sutherland contacted Mr. Honaker and Mr. Honaker informed him of the high CO alarm at the 2 East No. 3 belt drive sensor, that the 2 East No. 3 belt drive fire deluge system had activated, that alarms were being activated in sequence and that it did not look good. Mr. Sutherland called Mr. Creed back to request travel clearance to the top of North Mains to investigate the alarm and Mr. Creed instructed him to proceed to the top of North Mains. He stated that while traveling the North Mains trackway, he saw light smoke at crosscut number nine and encountered dense smoke at crosscut No. 25. He stated, that he detected 12 ppm CO at the dense smoke and the trackway was invisible due to the dense smoke, and that at this time he retreated back to the entrance of 6 West.
9. Mr. Michael Monk, third shift mine foreman, stated that Mr. Creed informed him of the high CO alarm at the 2 East No. 3 belt drive and smoke observed on the 2 North Mains trackway. He stated that Mr. Creed also informed him that he was planning to hold third shift personnel at the entrance of 6 West. He stated that he authorized Mr. Creed's intention to evacuate mine personnel and at this time there were approximately 60 mine personnel underground, including 15 second shift personnel. He stated that he notified Mr. Bill Meade, mine superintendent, and informed him of the mine emergency and evacuation of mine personnel. He stated that while located on the Garden side, he assembled available fire-fighting equipment and then traveled

overland to the Deskens side. He stated that he traveled underground on the Deskens side to assist with fire-fighting efforts.

10. Mr. Gilbert, second shift construction foreman, stated that he began conducting pre-shift examinations on the second shift, on April 9, 2003, at approximately 9:30 p.m. He stated that he started pre-shift examinations at the entrance of 5 West, located on the Garden side, and then traveled back toward the Deskens side. He stated that at approximately 10:00 p.m., he traveled by the 2 East No. 3 belt conveyor drive while enroute to conduct a pre-shift examination of the Deskens bunker control station. He stated that he conducted a pre-shift examination of the bunker control station including the T-35 combination transformer. He stated that he did not conduct a pre-shift examination of the 2 East No. 3 belt drive, because the second shift belt examiner was responsible for this examination. He stated that he traveled underneath the 2 East No. 3 belt crossway, located in close proximity to the 2 East No. 3 belt drive power rollers, while enroute to the bunker control station. He stated that as he traveled by this area while enroute to the bunker control station, he did not observe anything in the belt drive area that may have caused or contributed to the fire.
11. Mr. Street, second shift beltman, stated that on April 5, 2003, the 2 East No. 3 belt conveyor take-up stationary roller bearing was warm and that he applied water to this bearing two times during his shift. He stated that he did not observe any other signs of heating after applying water to the bearing the second time. He stated that on two other occasions following the incident on April 5, 2003, he observed heating problems at the stationary roller bearing requiring him to cool the bearing and belt drive frame with water. He described the following problems that had occurred at the 2 East No. 3 belt drive area after April 5, 2003 but prior to April 9, 2003: (1) the off-track side belt conveyor, take-up, stationary roller bearing had been getting hot and that several days before the accident he had observed smoke in this area and that he had sprayed the bearing with water; (2) the belt was out of alignment causing it to rub the sides of the belt drive assembly. He stated that at the beginning of the second shift, on April 9, 2003, he visually inspected the off-track side of the belt drive to ensure that the take-up stationary roller bearing was not hot, that the belt was not rubbing the belt drive frame and did not observe evidence of either condition. He stated that he did not observe anything abnormal or experience any problems with the 2 East No. 3 belt conveyor system on his shift on April 9, 2003. Mr. Street stated that he applied rock dust at the belt drive area before departing the bunker area enroute to the Deskens B Shaft bottom.
12. Mr. Frank Combs, second shift 6 West longwall section production foreman, stated that he supervised nine personnel conducting longwall production activities on the 6 West longwall on the second shift, on April 9, 2003. He stated that the production activities consisted of completing mining operations necessary to align the longwall face at the longwall section pull out point in preparation for the longwall move. He stated that on April 9, 2003, near the end of the second shift, from approximately 11:00 p.m. to 12:10 a.m. on April 10, the 6 West longwall mining production operations were intermittent and the type of material being mined from the longwall face was very wet coal and rock. He stated that Mr. Arvil Payne, second shift longwall stageloader operator, was positioned at the stageloader operator control station during production activities, and Mr. Payne de-energized the longwall face equipment upon completion of the mining operations, at approximately 12:10 a.m. He stated that the longwall section telephone

was located at the stageloader control station and at approximately 12:15 a.m., as the longwall production crew departed the longwall face area to prepare to travel to the Garden B Shaft bottom, they traveled by the stageloader operator control station. He stated that during this time he did not observe activation of the section telephone visual signal and that he did not hear the telephone paging. He stated that as he and his crew traveled toward the section trackway, he heard a diesel powered mantrip traveling toward the section. He stated that his crew was waiting at the end of the section trackway when a third shift employee arrived with a diesel powered mantrip, at approximately 12:30 a.m. He stated that he was informed of the CO warning alarms by the third shift mantrip operator and immediately made a gas test using a handheld MX-270 gas detection instrument and did not detect any CO. He stated that his crew boarded the mantrip and traveled to the entrance of the 6 West longwall section where he observed the 7 West longwall section crew mantrip traveling toward the Garden B Shaft bottom. He stated that he and three third shift foremen stayed at the entrance to the 6 West Longwall section while his crew traveled to the Garden B Shaft bottom to exit the mine. He stated that he remained at the entrance of 6 West longwall with Mr. Sutherland, Mr. Whitt and Mr. David Allen, section mine foreman, while awaiting further instructions. They decided not to attempt travel from the Garden side to the Deskins side of the mine. He stated that at approximately 1:00 a.m., he and the three third shift mine personnel departed the entrance to the 6 West longwall section and traveled to the Garden B Shaft bottom and exited the mine. He stated that from the time he was notified of the CO alarms on the 6 West longwall section and during the time that he was located at the entrance of the 6 West longwall section, he did not observe any smoke.

13. Mr. Alexander Tomblin, second shift belt examiner, stated that on April 5, 2003, he and Mr. Street discussed a hot bearing problem involving the off-track side bearing provided for the belt conveyor, take-up, stationary roller and a belt alignment problem, both associated with the 2 East No. 3 belt conveyor. He stated that he assisted Mr. Street in applying water to the hot bearing. He stated that he conducted an on-shift examination of the 2 East No. 3 belt conveyor system on April 9, 2003 from approximately 7:30 p.m. to 8:15 p.m. He stated that he did not observe any accumulations of coal or coal spillage in the vicinity of the 2 East No. 3 belt conveyor drive and belt conveyor take-up unit and that the area was rock-dusted. He stated that he did not observe the belt rubbing at any location within the belt drive assembly and that the belt structure rollers were operating properly. He stated that the type of material being transported on the belt system consisted of coal, rock and water and that this condition resulted in the belt structure rollers depositing water and mud on the mine floor underneath the bottom belt rollers. He also stated that the 2 East No. 3 belt conveyor drive and take-up areas were wet as a result of this condition. Mr. Tomblin's mine examination record for the 2 East No. 3 belt conveyor did not identify any hazards.
14. Mr. Kim Noah, second shift mine foreman, stated that the mine evacuation was completed at 1:16 a.m. with all personnel either on the surface or accounted for underground. Mr. Noah stated that on the night of the fire, on April 9, 2003, coal was diverted from the Deskins side belts to the Garden side belts at approximately 11:15 p.m.
15. Mr. John Teets, second shift construction foreman, stated that he traveled the 2 East No. 3 belt and track haulageway on two occasions during his shift on April 9, 2003. He stated that he traveled by this area at approximately 11:00 p.m. while enroute to the Garden shaft bottom, and

then returned back by this area at approximately 11:40 p.m. while enroute to the Deskins shaft bottom and did not observe any indications of heat, smoke or fire as he passed by the 2 East No. 3 belt drive area.

16. Mr. Elmer Deel, day shift Chief Electrician, stated that second shift personnel had reported on April 5, 2003, that the 2 East No. 3 belt conveyor, off-track side, take-up, stationary roller bearing may not be operating properly. He stated that he checked this bearing on April 7, 2003, and did not observe any defect or problem with the bearing. Mr. Deel is responsible for all maintenance activities at the VP No. 8 Mine.
17. Mine management personnel stated that during the rehabilitation work being performed to restore the 2 East No. 3 belt conveyor system, including the existing undamaged 2 East No. 3 belt discharge drive roller assembly, and the undamaged belt drive power roller assembly, surveys were completed to evaluate proper component alignment prior to installing the replacement belt system. They determined that the elevated belt drive discharge roller assembly provided for the 2 East No. 3 belt conveyor was out of alignment approximately 17 inches. The discharge roller is located at the coal bunker storage transfer area, outby the belt drive power roller assembly. The steel structural support frame used to elevate the drive discharge roller assembly had apparently been bent and damaged. The damaged angle steel support beam was located on the track side of the discharge drive roller frame assembly. They suspected that stress relief in the mine floor, commonly known as heaving floor conditions, had occurred resulting in the improper alignment of the belt discharge drive roller assembly. They also determined that the 2 East No. 3 belt drive take-up assembly frame was not level. Heaving floor conditions were also suspected to have been a contributing factor resulting in improper alignment of the belt take-up unit.
18. A general consensus of mine personnel was that no problems had occurred with the operation of the 2 East No. 3 belt conveyor system on the day shift and second shift on April 9, 2003, prior to the fire, except for the two occasions that the belt stopped operating near the end of the second shift as reported by Mr. Mathena.

DISCUSSION: DESKINS 2 EAST NO. 3 BELT CONVEYOR DRIVE ASSEMBLY

A. ELECTRICAL SYSTEM:

- 1) The 2 East No. 3 belt conveyor system is one part of a seven-part, belt conveyor haulage system that was utilized to transport coal from the Garden 6 West longwall section and the 8 West development section to the Deskins Production A Shaft (skip shaft).
- 2) The 2 East No. 3 belt conveyor is designed to transfer coal to either the Deskins coal storage bunker area or to the 2 East No. 2 belt that in turn transports the coal to the Deskins Production A Shaft.
- 3) The 2 East No. 3 belt drive and bunker electrical systems are provided with an incoming 7,200 volt alternating current (AC), three phase power supply. The 7,200 volt high voltage

power circuit is provided by a 4/0 American Wire Gauge (AWG), 8 KV Anaconda, shielded high voltage cable.

- 4) A T-35 combination transformer and belt control system, with an input of 7,200 volts, provides the electrical power source for the 2 East No. 3 belt drive system. The Mining Controls, Inc., T-35 transformer, model no. 29783-1-27336-1090, provides 4,160, 2,400, and 480 output voltages for circuits controlled by the transformer.
- 5) A bunker electrical control station panel is located adjacent to the T-35 combination transformer and is utilized to integrate the 2 East No. 3 belt conveyor and bunker electrical control systems. The bunker electrical control panel receives power from the T-35 combination transformer.
- 6) The 2 East No. 3 belt drive assembly was originally equipped with two – 2,400 volt, 350 horsepower (HP) belt drive motors but only one motor was being utilized at the time of the accident. The 2,400 volt belt drive motor is electrically controlled by an Allen Bradley 5515 Programmable Logic Controller (PLC) and a Toshiba Vacuum Contactor Controller. The PLC controls the Toshiba Vacuum Contactor Controller. The PLC is designed to coordinate and sequence all functions of the control and monitoring circuits associated with the 2 East No. 3 belt drive assembly.
- 7) The Toshiba Vacuum Contactor Controller, designed to start and stop the belt drive motor, is rated for a 5,000 volt, 400 ampere capacity. The contactor controller was equipped with over-current and short circuit protection systems. The contactor controller was equipped with a Femco ground monitoring system. The contactor controller was also equipped with a GB Harrison ground fault protector, type GF2B, with a trip range of 80 to 100 milliamps.
- 8) The 2 East No. 3 belt drive assembly was equipped with belt slip and sequence controls. The belt slip system consisted of a Butler Wiring Incorporated (BWI) Hawkeye proximity sensor unit controlled by a BWI Eagle Model 2 electrical control unit. The Hawkeye proximity sensor unit was located on the off-track side of the belt and was mounted on the take-up, stationary roller bearing frame. The BWI Eagle Model 2 electrical control unit was located in the bunker control panel. The 2 East No. 3 belt conveyor sequence sensor control unit monitored operation of the 2 East No. 2 belt conveyor that controlled operation of the 2 East No. 3 belt conveyor in the event that the 2 East No. 2 belt conveyor stopped operating.
- 9) The 2 East No. 3 belt drive assembly was equipped with a remote electrical control circuit used to start and stop belt operations. The remote control belt start/stop and bunker control switches are located in the bunker control station where a person can observe and monitor belt operations. These remote control start/stop switches receive power and are controlled by the T-35 combination power transformer.
- 10) The 2 East No. 3 belt drive assembly was equipped with a hydraulic, belt take-up unit that was powered by a 40 HP, 480 volt alternating current (AC) motor. The electrical component of the take-up unit is located in and controlled by the T-35 combination transformer belt control unit. The 480 volt circuit breaker short circuit trip range was 300 to 700 amps and

was set on 300 amps to provide protection for the Anaconda GGC, No. 6 AWG, power supply cable. A Femco ground monitoring unit, model no. RL2822, was utilized to provide ground fault monitoring for the electrical components of the take-up assembly.

B. FIRE DELUGE SYSTEM:

1. The 2 East No. 3 belt conveyor drive assembly was provided with an ECKO Model 310-C dry chemical fire deluge system that is designed to detect and suppress fires. This deluge system operates from a 12 volt battery power supply and is equipped with a gel-cel four hour battery back-up system. This system has a control panel that constantly monitors excessive heat through fire sensors installed at strategic locations along the belt drive assembly. The system is activated when any sensor detects excessive heat. The control panel activates a carbon dioxide (CO₂) charge on each of five dry chemical reserve tanks. The CO₂ charge forces the dry chemical out of the tanks and onto a fire area through three-fourths inch distribution lines designed with 20 brass spray nozzles. Each spray nozzle has its own blow-off dust cover. The nozzles are located to spray the upper and bottom surfaces of the top belt and the upper surface of the bottom belt. The control panel has a 110 volt AC circuit that is connected to the PLC that controls operation of the belt drive motor. The control panel simultaneously de-energizes the belt drive motor and gives both an audible and visual alarm at the control panel when a sensor detects excessive heat. When this system is activated, the audible and visual alarms remain until the panel is reset or the alarm disable switch, located on the panel cover, is turned to the “disable” position. The fire deluge system is connected to the CO surface master station computer located on the Garden side and is continuously monitored by the warehouse supervisor. The investigation revealed that the fire deluge system at the 2 East No. 3 belt drive assembly activated on April 10, 2003, at 12:23 a.m.

C. CARBON MONOXIDE MONITORING SYSTEM:

1. The mine has a Division of Mines approved plan that allows air used to ventilate belt haulage entries to be used to ventilate section working places, in accordance with Section 45.1-161.221.F. of the Coal Mine Safety Laws of Virginia. The approved plan provides safeguards to provide adequate protection from belt fires.
2. A system of monitoring stations is installed primarily to monitor carbon monoxide levels in the mine air coursed through the belt haulageways. The carbon monoxide monitoring system is a Genesis Control Series, Version 3.6. The system is designed with sensors installed at strategic locations along the belt conveyor haulageways in-line with the direction of the ventilation air current. The design allows sensors to be activated in sequence in-line with the direction of the ventilation air current.
3. The CO monitoring system is equipped with outstations that accept signals from the CO sensors as both outstations and sensors are installed at various locations

- along the belt haulage systems. The outstations receive analog information from the sensors and transmit them as digital information to the surface master station. The outstations are installed at strategic locations throughout the mine so that selected sensors can be connected to applicable outstations. Thirteen outstations are connected to the surface master station, and each one is capable of monitoring up to 16 CO sensors. The CO monitoring system is equipped with a four-hour battery back-up system.
4. The CO monitoring system activates a low alarm when a sensor detects seven ppm CO. The system activates a high alarm when a sensor detects twelve ppm CO. An ambient level of two ppm CO in the mine atmosphere was determined by air analysis.
 5. When a CO alarm level is detected by the system, an audible alarm is sounded at the surface master station and the location and type of alarm are displayed on a printer and a computer screen. The surface master station is located in the Garden warehouse facility and is continuously monitored by the warehouse supervisor.
 6. The CO monitoring sensors are Rel-Tek, FireBoss 100B, stationary, carbon monoxide sensors / analyzers. The sensors are provided with an indicating digital meter with a range scale from 0-25 parts per million (ppm). The sensor enclosure consists of a non-conductive fiberglass unit equipped with local and remote digital read-outs.
 7. The CO sensors are installed in accordance with the following requirements specified in the referenced approved plan:
 - a) The sensor for a belt tailpiece cannot be located more than 50 feet in by the tailpiece;
 - b) Sensors will be located so that the air is monitored at each belt drive and tailpiece and at 2,000 feet intervals if installed before July 1, 1994 and at 1,000 feet intervals if installed after July 1, 1994;
 - c) Where a belt drive discharges onto a belt conveyor tailpiece as a continuation of a belt conveyor haulage system, without change of direction of the belt conveyor drive and belt conveyor tailpiece, and are on the same split of air traveling in the same direction, only one sensor will be required. The sensor will be installed not more than 100 feet in by the drive, belt take-up, and tailpiece on the same split of air.
 8. The following examinations and tests are required to be performed on the CO monitoring system in accordance with the approved plan:
 - a) Daily examination: A qualified person will visually examine the CO sensors located along operating belts on each production shift. The results of the examinations will be recorded. The responsible person on duty on the surface will check the surface master station to insure

that all outstations and sensors are reporting properly for each shift that persons are underground.

- b) Weekly examinations: A repairman will examine each remote unit and each sensor connected to that unit to insure the units and sensors are: properly mounted; secured and not damaged; and checked to insure proper operation. The results of the examinations will be recorded.
- c) Monthly calibration tests: A repairman will calibrate each unit and all sensors with a known CO concentration at least once each month (not to exceed 30 days). All units and sensors will be checked for damage, moisture, and proper operation. The remote shutdown relay will be activated at the master control station. The four-hour battery back-up system will also be tested. The results of the calibration and tests will be recorded.

CONCLUSION

On April 10, 2003, at approximately 12:20 a.m., a mine fire was discovered underground at the Island Creek Coal Company, VP No. 8 Mine, Mine Index 08776AC. The fire was discovered in the belt and track entry of 2 East Mains at the 2 East No. 3 belt conveyor system. The fire of unknown origin occurred at the 2 East No. 3 belt conveyor drive assembly located in the No. 4 entry of the 2 East Mains, located on the Deskins side of the mine. The fire extended approximately 1,225 feet in the 2 East Mains including the entire 2 East No. 3 belt conveyor system, components of the active 5C and inactive 8C belt conveyor systems, supplemental roof supports provided for the 2 East No. 3 belt and track entry, high voltage cable, and associated electrical systems. Although extensive damage occurred in the affected area of the mine, no injuries were reported as a result of the accident. The fire was brought under control at approximately 10:30 a.m. and extinguished at 12:25 p.m. on April 10, 2003.

ENFORCEMENT ACTION

The following enforcement action was taken as a result of the investigation:

1. An order of closure, No. TAR0004274, was issued under Section 45.1-161.91.A. (ii) of the Coal Mine Safety Laws of Virginia to control and preserve the scene of the accident pending an investigation. The order of closure was modified to allow implementation of an action plan and a rehabilitation plan. The order of closure was also modified to permit coal production to resume on the Garden side of the mine following an inspection of the respective belt conveyor haulage systems.
2. A notice of violation, No. TAR0004304, was issued under Section 45.1-161.189.E. of the Coal Mine Safety Laws of Virginia: A mine fire accident investigation revealed that electrical components consisting of two ground fault monitoring circuit units and one 120 volt alternating current (AC) input to 24 volt direct current (DC) power supply component were not secured in

the Mining Controls, Inc., T-35 combination transformer, model no. 29783-1-27336-1090, provided for the 2 East No. 3 belt drive assembly.

3. A notice of violation, No. TAR0004305, was issued under Section 45.1-161.221.F. of the Coal Mine Safety Laws of Virginia: A mine fire investigation revealed that the CO Monitoring System plan approved in accordance with Section 45.1-161.221.F. of the Coal Mine Safety Laws of Virginia was not complied with on April 9, 2003 and April 10, 2003. The following compliance factors were determined:
 - The required procedures for immediate notification of the active working sections involving the 6 West longwall section was not complied with. Mine personnel were not immediately notified following notification of a high warning CO alarm of an unknown origin, that was received at the Garden warehouse master control station. The high warning CO alarm was received at 12:09 a.m. for the CO sensor located at the 2 East No. 3 belt drive and the 6 West longwall section personnel had no knowledge of any CO warning alarm until a third shift person arrived on the section at approximately 12:30 a.m. to transport them to the Garden shaft bottom. Mine personnel located on the 6 West longwall section were located in an area ventilated by an air current which passed over the location where the alarm originated.
 - A notification system was not established on the third shift to determine the duration of an alarm status in order to initiate evacuation of mine personnel following a CO alarm of an unknown origin. The third shift warehouse supervisor was unaware of notification procedures for an alarm that exists more than 90 seconds.
 - At 11:52 p.m. on April 9, 2003, a low warning CO alarm was received at the master control station and the mine personnel on the 6 West and 7 West longwall sections were not notified immediately following a period of time that exceeded 90 seconds. The duration of the low warning CO alarm was approximately three minutes.
4. A notice of violation, No. TAR0004318, was issued under Section 45.1-161.200.E. of the Coal Mine Safety Laws of Virginia: A mine fire accident investigation revealed that the ECKO, Inc. Model 310-C dry chemical fire deluge system provided for the 2 East No. 3 belt drive assembly was not maintained in an operative condition in accordance with manufacturer specifications. The following conditions were determined: (1) Nozzle protective caps provided for two discharge outlets located on the off-track side of the drive power roller assembly were secured in place with wire in such a manner that the caps could not be propelled free of the discharge outlet when the system was activated; (2) A discharge outlet, located on the off-track side in by the second drive power roller, was positioned against the frame of the top belt structure in a manner that would prevent the activated dry chemical agent from contacting the surfaces of the bottom and top belts; (3) A discharge nozzle was missing from a chemical supply line, located on the trackside of the belt drive.

RECOMMENDATIONS

1. The CO Monitoring Plan should be reviewed with all employees.
2. The mine ventilation system should be reviewed with mine personnel responsible for responding to low and high warning CO alarms. Mine personnel responsible for responding to CO alarms should have a basic knowledge of the mine ventilation systems and should be kept informed of ventilation changes with respect to the working sections ventilated with air currents used to ventilate belt haulage entries.
3. The CO sensors installed to monitor belt conveyor drive assemblies should be installed in a manner to provide rapid detection of CO generated from potential heat sources. The location of a CO sensor or the installation of more than one CO sensor should be considered in areas where the direction and velocity of ventilation air currents could materially affect the CO sensors capability to provide early detection of the presence of a fire.
4. Dry chemical fire deluge systems installed in the mine should be evaluated to determine their effectiveness when installed where substantial ventilation air velocities could materially affect the fire suppression capabilities of the systems.

APPENDIX

- PERSONS PRESENT DURING THE INVESTIGATION
- MINE LICENSE INFORMATION
- MAP OF FIRE AREA

SIGNATURE SHEET

This report is hereby submitted by Terry A. Ratliff and approved by Frank A. Linkous.

TERRY A. RATLIFF, COAL MINE INSPECTOR

DATE

FRANK A. LINKOUS, CHIEF

DATE

PERSONNEL

The following personnel provided information and/or were present during the investigation:

CONSOLIDATION COAL COMPANY

Barry Dangerfield	Vice President of Operations
David Berry	Safety Manager
Bill Fertall	Manager of Engineering
Bill Tolliver	Corporate Safety Inspector

ISLAND CREEK COAL COMPANY

William Meade	Superintendent	
Mike Canada	Safety Supervisor	Day Shift
Elmer Deel	Chief Electrician	Day Shift
Darrell Hess	Belt Foreman	Day Shift
James Tolliver	Belt Examiner	Day Shift
Kim Noah	Shift Mine Foreman	Second Shift
Dana Gilbert	Construction Foreman	Second Shift
John Teets	Construction Foreman	Second Shift
Alexander Tomblin	Belt Examiner	Second Shift
Michael Cooper	Dispatcher	Second Shift
Larry Street	Beltman	Second Shift
Gerald Mathena	Beltman	Second Shift
William Murray	Electrician	Second Shift
Michael Monk	Shift Mine Foreman	Third Shift
Jimmy Stiltner	Construction Foreman	Third Shift
Bob Sutherland	Construction Foreman	Third Shift
Eddie Breeding	Maintenance Foreman	Third Shift
Dale Honaker	Warehouse Supervisor	Third Shift
Harold Creed	Dispatcher	Third Shift

MINE SAFETY AND HEALTH ADMINISTRATION

Edward Morgan	District Manager, District 5
Charlie Walls	Inspection Supervisor
Luther Marrs	Inspection Supervisor
David Woodward	Mining Engineer
Carl Duty	Coal Mine Inspector
Russell Dresch	Electrical Engineer
Carl Coleman	Coal Mine Inspector
Doug Carico	Mining Engineer
Bill Francart	Safety and Health Technology Center, Pittsburg, Pennsylvania
Robert Phillips	Safety Division, Arlington, Virginia

VIRGINIA DIVISION OF MINES

Frank Linkous	Chief, Division of Mines
Opie McKinney	Mine Inspector Supervisor
Carroll Green	Mine Inspector Supervisor
Joseph Altizer	Coal Mine Inspector
Danny Altizer	Coal Mine Inspector
Don Keen	Coal Mine Inspector
Terry Ratliff	Coal Mine Inspector
Bill Messick	Coal Mine Inspector
Dwight Miller	Coal Mine Technical Specialist
Wayne Davis	Coal Mine Technical Specialist
David Elswick	Coal Mine Technical Specialist

UNITED MINE WORKERS OF AMERICA

Max Kennedy	International Representative
Bill Shelton	Safety Committeeman
Lonnie Alsbrook	Safety Committeeman
Ralph Looney	Safety Committeeman
Danny Sparks	President of Local Union 2232

MINE LICENSE INFORMATION

Official Corporation:	Island Creek Coal Company
Official Business Name of Operator:	Island Creek Coal Company
Person with Overall Responsibility:	William Meade
Person in Charge of Health and Safety:	William Meade

LIST OF PERSONS INTERVIEWED

Bill Meade	Superintendent
Darrell Hess	Belt Foreman
Elmer Deel	Chief Electrician
James Tolliver	Belt Examiner
Kim Noah	Shift Foreman
John Teets	Construction Foreman
Dana Gilbert	Construction Foreman
Gerald Mathena	Beltman
Larry Street	Beltman
Michael Cooper	Dispatcher
Alexander Tomblin	Belt Examiner
William Murray	Electrician
Michael Monk	Shift Foreman
Bob Sutherland	Construction Foreman
Jimmy Stiltner	Construction Foreman
Eddie Breeding	Maintenance Foreman
Harold Creed	Dispatcher
Dale Honaker	Warehouse Supervisor